We claim:

1. A polypeptide selected from the group consisting of SEQ ID NOs:11 through 14, SEQ ID NO:18, SEQ ID NOs: 21 through 26, SEQ ID NOs: 32 through 36, SEQ ID NOs: 40 through 53, SEQ ID NOs: 57 through 61, SEQ ID NOs: 63 through 99, SEQ ID NOs: 102 through 119, SEQ ID NOs: 121 through 137, SEQ ID NOs: 139 through 177, SEQ ID NOs: 179, 180, SEQ ID NOs: 183 through 202, SEQ ID NOs: 322 through 341 and functionally equivalent fragments, derivatives and variants thereof.

2. A polynucleotide encoding a polypeptide sequence of claim 1, or a degenerate variant thereof.

3. A vector comprising a polynucleotide of claim 2.

4. A host cell comprising a vector of claim 3.

5. A method for producing a polypeptide comprising:

a) culturing the host cell of claim 4 under conditions suitable for the expression of said polypeptide; and

b) recovering the polypeptide from the host cell culture.

6. A pharmaceutical composition comprising a polypeptide of claim 1 in combination with a pharmaceutically acceptable carrier.

7. A gene therapy composition comprising a polynucleotide of claim 2 in combination with a therapeutically effective gene therapy vector.

8. The polypeptide of claim 1 wherein said polypeptide is represented by SEQ ID NO: 18.

9. The polypeptide of claim 1 wherein said polypeptide is represented by SEQ ID NO: 32.

10. The polypeptide of claim 1 wherein said polypeptide is represented by SEQ ID NO: 43.

11. The polypeptide of claim 1 wherein said polypeptide is represented by SEQ ID NO: 45.

12. The polypeptide of claim 1 wherein said polypeptide is represented by SEQ ID NO: 47.

13. The polypeptide of claim 1 wherein said polypeptide is represented by SEQ ID NO: 50.

14. The polypeptide of claim 1 wherein said polypeptide is represented by SEQ ID NO: 52.

15. The polypeptide of claim 1 wherein said polypeptide is represented by SEQ ID NO: 71.

16. The polypeptide of claim 1 wherein said polypeptide is represented by SEQ ID NO: 72.

17. The polypeptide of claim 1 wherein said polypeptide is represented by SEQ ID NO: 83.

18. The polypeptide of claim 1 wherein said polypeptide is represented by SEQ ID NO: 86.

19. The polypeptide of claim 1 wherein said polypeptide is represented by SEQ ID NO: 87.

20. A purified antibody which binds specifically to the polypeptide of claim 1.

21. A method of treating a metabolic disorder in a mammal comprising administering to the mammal a therapeutically effective amount of a PACAP R3 agonist.

22. A method of claim 21, wherein the PACAP R3 agonist has at least about 10-fold selectivity for PACAP R3 over PACAP R2 or PACAP R1.

23. The method of claim 21, wherein the PACAP R3 agonist has at least about 100-fold selectivity for PACAP R3 over PACAP R2 or PACAP R1.

24. The method of claim 21, wherein the PACAP R3 agonist is selected from the group consisting of SEQ ID NOs:11 through 14, SEQ ID NO:18, SEQ ID NOs: 21 through 26, SEQ ID NOs: 32 through 36, SEQ ID NOs: 40 through 53, SEQ ID NOs: 57 through 61, SEQ ID NOs: 63 through 99, SEQ ID NOs: 102 through 119, SEQ ID NOs: 121 through 137, SEQ ID NOs: 139 through 177, SEQ ID NOs: 179, 180, SEQ ID NOs: 183 through 202, SEQ ID NOs: 322 through 341 and functionally equivalent fragments, derivatives and variants thereof.

25. The method of claim 24, wherein the R3 agonist is selected from the group consisting of SEQ ID NO: 18, SEQ ID NO:32, SEQ ID NO:43, SEQ ID NO:45, SEQ ID NO:47, SEQ ID NO:50, SEQ ID NO:52, SEQ ID NO:71, SEQ ID NO:72, SEQ ID NO:83, SEQ ID NO:86 and SEQ ID NO:87.

26. The method of claim 21 wherein said metabolic disorder is type 2 diabetes.

27. The method of claim 21 wherein said therapeutically effective amount ranges from about 0.1ug/kg to about 1mg/kg.

28. The method of claim 21 wherein said metabolic disorder is the pre-diabetic state of impaired glucose tolerance.

29. A vasoactive intestinal peptide variant having one of the structures of Figure 1, and the functional equivalents thereof.

30. A method of stimulating insulin release in a glucose-dependent manner in a mammal in need thereof by administering to said mammal a polypeptide selected from the group consisting of the polypeptides of Figure 1.

31. A method of treating respiratory disease in a mammal comprising administering to the mammal a therapeutically effective amount of a peptide selected from the group consisting of SEQ ID NOs:11 through 14, SEQ ID NO:18, SEQ ID NOs: 21 through 26, SEQ ID NOs: 32 through 36, SEQ ID NOs: 40 through 53, SEQ ID NOs: 57 through 61, SEQ ID NOs: 63 through 99, SEQ ID NOs: 102 through 119, SEQ ID NOs: 121 through 137, SEQ ID NOs: 139 through 177, SEQ ID NOs: 179, 180, SEQ ID NOs: 183 through 202, SEQ ID NOs: 322 through 341 and functionally equivalent fragments, derivatives and variants thereof.